

## CLAIMS

*Sub A1* What is claimed is

5 1. A method for reducing line edge roughness of photoresist, comprising:

providing a photoresist, said photoresist at least having a trench; and

filling said trenches, said trenches being totally filled by an additional material.

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2. The method of claim 1, said trenches are located on sidewall of said photoresist.

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3. The method of claim 1, said trenches are located on this top of said photoresist.

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4. The method of claim 1, said additional material being adhered to said photoresist.

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5. The method of claim 1, said additional material being adhered to said photoresist by a chemical reaction.

6. The method of claim 1, said additional material being adhered to said photoresist by a physical reaction.

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7. The method of claim 1, wherein available method for filling said trenches with said additional material is chosen from the group consisting of spin coating, dip, and spray.

8. The method of claim 1, said additional material being a fluid material.

9. The method of claim 1, said additional material being chosen from the group consisting of solution and suspension.

10. The method of claim 1, said additional material being thermosetting polymer.

11. The method of claim 1, said additional material being thermoplasticity polymer.

*Sub A2* 12. The method of claim 1, said additional material could be reacted with a hydroxyl group or proton of said photoresist.

13. The method of claim 1, said additional material being chosen form the group consisting of PMMA, POLY IMIDE, RELACS, material with a plurality of -NH groups, and material with a plurality of -OH groups.

*Sub A3* 14. A method for reducing line edge roughness of photoresist, comprising:

providing a photoresist which at least having a trench;

filling said trenches so let that said trenches are totally filled by

an additional material; and

treating said additional material so let that adhesion between said additional material and said photoresist is enhanced after said additional material is treated.

15. The method of claim 14, said trenches being located on  
sidewall of said photoresist.

16. The method of claim 14, said trenches being located on  
5 top of said photoresist.

10 17. The method of claim 6, wherein available method for  
treating said additional material is chosen from the group consisting of  
thermal treatment, ultraviolet light curing, electrons beam curing,  
treatment of chemical reaction, and chemical reaction between a  
plurality of functional groups of said photoresist and a plurality of  
functional groups of said additional materials.

15 18. A method for reducing line edge roughness of photoresist,  
comprising:

20 providing a photoresist, said photoresist at least having a  
trench and being located on a substrate;

removing part of said additional material, removed part of said  
25 additional material being located on said photoresist and said substrate.

19. The method of claim 18, wherein available method for  
filling said trenches with said additional material is chosen from the  
25 group consisting of spin coating (dip) and spray.

20. The method of claim 18, wherein available method for  
removing part of said additional material is chosen from the group  
consisting of thermal treatment and spin.

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# **M thod For R ducing Line Edge Roughness Of Photoresist**

## **ABSTRACT OF THE INVENTION**

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A method for reducing line edge roughness of photoresist, at least include: provide a photoresist which at least has a trench and is located on substrate; fill trenches so let that trenches are totally filled by an additional material; remove part of additional material which is located on photoresist and substrate; and treat additional material so let that adhesion between additional material and photoresist is enhanced after additional material is treated. Moreover, while only trenches are filled by additional material, step of removing part of additional material could be omitted; while adhesion between additional material and photoresist is good, step of treating additional material could be omitted.

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